A Chromosome Study of *Brahmaea japonica* Butler (Lepidoptera, Brahmaeidae).

Euroasiatic species of Brahmaeidae present polymorphic populations with an uneven geographic distribution. The disputed taxonomy of this group is also due to the occurrence of populations that show morphological characters intermediate between related species (see fig. 1).

The study of chromosomes could help to explain the affinity among different species. In this regard only *Acanthobrahmaea europaea* Hartig (n = 32, 2n = 64) has been recently investigated (Trentini and Marini, 1985: Atti XIV Congr. naz. ital. Ent.: 299-303).

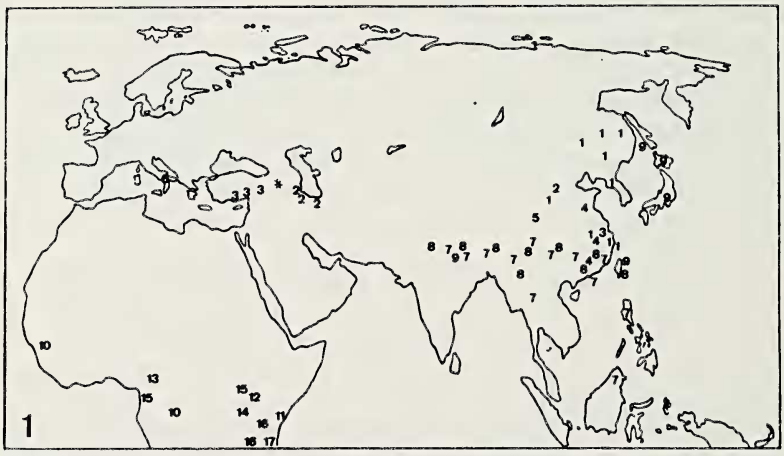
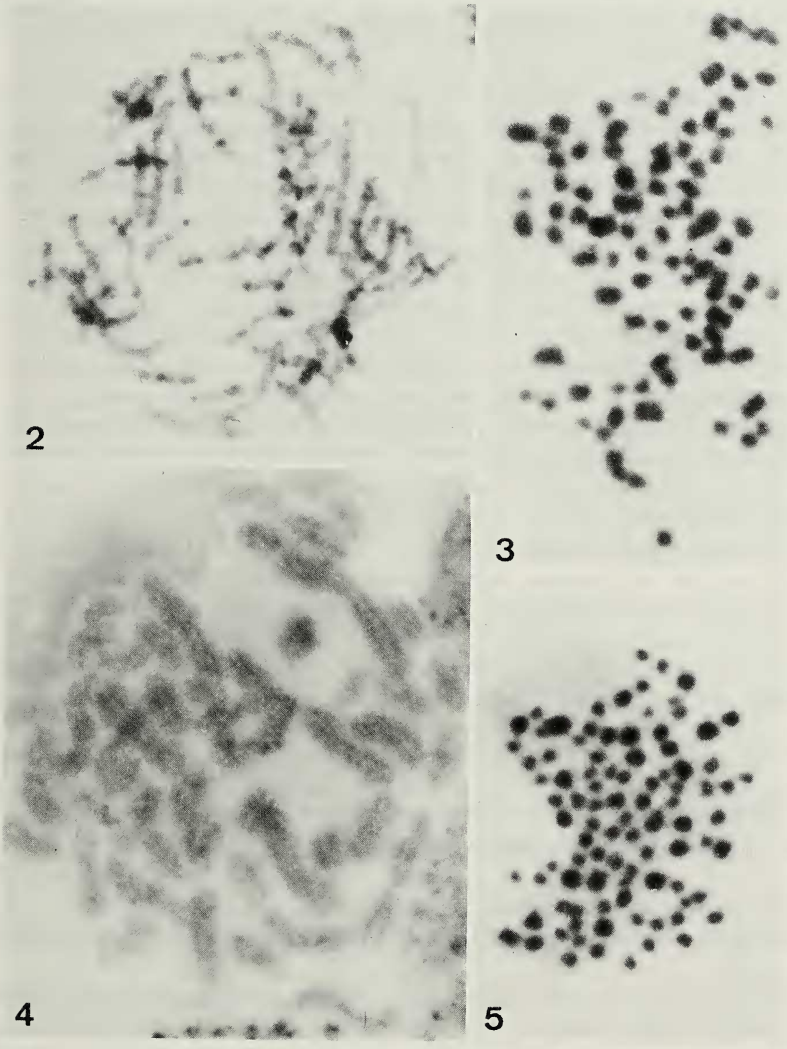


Fig. 1. Geographic distribution of Brahmaeidae. The data were obtained from papers of Staudinger and Rebel (1901: Friedlander & Sohn Ed., Berlin), Seitz (1911: A. Kernen Verlag, Stuttgart), Mell (1928: A. Kernen Verlag, Stuttgart; 1929: Dtsch. Ent. Z., 5: 337-494; 1937: Dtsch. Ent. Z., 1-19), Rougeot (1971: Masson & Cie Ed., Paris), Chu and Wang (1977: Acta Entomol. Sin., 20: 83-85), Nässig (1980: Nachr. ent. Ver. Apollo, N.F., 1: 77–91), Freina (1982: Entomofauna, 3(9): 129-139), Freina and Witt (1982: Nota lepid., 5 (2-3): 81-85). Euroasiatic species: 1, *Brahmaea certhia* F.; 2, *Brahmeae christophi* Stgr; 3, *Brahmaea ledereri* Rghfr; 4, *Brahmaea porphyria* Chu & Wang; 5, *Calliprogonos miraculosa* Mell; 6, *Acanthobrahmaea europaea* Hertig. Indo-australian species: 7, *Brahmaea hearseyi* White; 8, *Brahmaea wallichi* Gray; 9, *Brahmaea japonica* Butlr. Ethiopian species: 10, *Dactyloceras lucina* Drury; 11, *Dactyloceras ocelligera* Butlr; 12, *Dactyloceras catenigera* Karsch; 13, *Dactyloceras bramarbas Karsch; 14, Dactyloceras barnsi* J. & T.; 15, *Dactyloceras ostentator* Hering; 16, *Dactyloceras Widenmanni* Karsch; 17, *Dactyloceras maculata* Conte.
* Freina (1982: Ibid.) reported a new record of a population of *Brahmaea ledereri* from Hakkari (Turkish Kurdistan region), that shows intermediate features between *B. ledereri* and *B. christophi*; for this reason the author considers *B. christophi* conspecific with *B. ledereri*.

The present research reports the early results obtained on the chromosome set of *Brahmaea japonica*, both males and females.

Brahmaea japonica was reared in 1986-1987 in laboratory on *Ligustrum* sp. and *Syringa vulgaris* from ova received from Japan. Karyological observations were carried out on eight pupae (4 males and 4 females) at one month before adult emergence, employing the air-dried technique (Trentini and Marini, 1986: Genetica, 68: 157-160); the detailed procedure is as follows: after 0.05% colchicine pretreatment for 2 h, testis and ovarioles were dissected out and kept under 1% sodium citrate for 20 min, fixed in 3:1 alcohol-acetic acid, dissociated in 60% acetic acid on a warmed slide, postfixed in Carnoy fluid, and stained with 2% Giemsa (pH 7) for 15-20 min at room temperature.



Figs. 2-5. Spermatogenesis (2, 3) and oogenesis (4, 5) of *Brahmaea japonica*. 2, pachytene; 3, C-metaphase; 4, achiasmatic bivalents; 5, oogonial C-metaphase.

Males. In pupal testes of *Brahmaea japonica* very few mitoses are present probably because the spermatogonial increase occurs in the last two instar larvae. The found C-metaphases show 94 chromosomes; they are rod- and dot-shaped and range from about 0.6 μm to about 2 μm (fig. 3). At the prophase of the first meiotic division 47 bivalents are visible (fig. 2).

Females. Ovarioles still show oogonial mitoses and the start of meiosis. Fifty mitotic C-metaphases of three specimens were scored for chromosome number: five metaphase plates present 2n = 93, forty-three 2n = 94, and two 2n = 95. The chromosomes are rod- and dot-shaped and their length ranges from about 0.7 μm to about 1.5 μm (fig. 5). Some prophases of the first meiotic division with 47 bivalents were observed; they consist of parallely aligned homologues showing their achiasmatic nature (fig. 4), as already reported in other Lepidoptera (Suomalainen, 1965: Chromosoma (Berlin), 16: 166-184; White, 1973: Cambridge Univ. Press).

With regard to the sex chromosome mechanism, the same chromosome number found in both males and females exlcudes an XO system and indicates an XY system, even though the sex chromosomes are undetectable in our preparations.

The only karyologically studied Brahmaeidae species, to our knowledge, are *Acanthobrahmaea europaea* (n = 32; 2n = 64) and *Brahmaea japonica* (n = 47; 2n = 94). The two species are very different in size and wing features, moreover they occur at the extremities of the euroasiatic region. Given the chromosome number 2n = 94 of *B. japonica*, it could be supposed that *B. japonica* presents a quasi-polyploidy (3n − 1) in relation to *A. europaea*. But two facts are contrary to this hypothesis: 1, the chromosomes of *A. europaea* are clearly larger than those of *B. japonica*; and 2, the genome of the two species is about the same size. We think that the variable chromosome numbers in Brahmaeidae are probably due to chromosomal rearrangements (fusion and dissociations), as already reported in other non-parthenogenetic Lepidoptera (Robinson, 1971: Pergamon Press, Oxford; White, 1973: Ibid.).

At a future time it would be valuable to examine the DNA content of both species and the chromosome complements of some other Brahmaeidae.

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Revisional notes on the Genus *Satarupa* Moore (Lepidoptera: Hesperiidae). I. New Synonyms of *Satarupa monbeigi* Oberthür.

Satarupa monbeigi Oberthür, 1921:76, pl. Y, Y bis.
= *Satarupa omeia* Okano, 1982:91-94, Pl. 1, figs. 1, 2 male; fig. 1, male genitalia (**Syn. nov.**)
= *Satarupa lii* Okano and Okano, 1984:124-126, Pl. 9, figs. 1, 2 male; figs. A, male genitalia (**Syn. nov.**)

In 1982, Okano described *Satarupa omeia* from Omeishan, Sichuan, Peoples Republic of China, as a new species. Two years later he described another "new" species, *Satarupa lii* (Okano and Okano, 1984), from exactly the same locality.